

SMART Tape For Structural Health Monitoring of Rocket Engines, Phase II

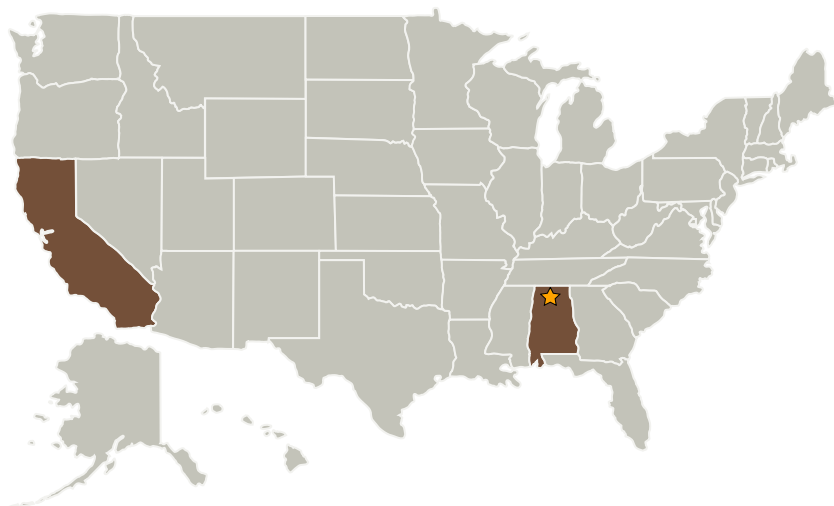
Completed Technology Project (2005 - 2007)



Project Introduction

Acellent Technologies, Inc. proposes to develop a SMART Tape system that can be used to perform rapid non-destructive evaluation in real time and provide long-term monitoring of pressure vessels in liquid rocket engines. Based on Acellent's existing SMART Layer technology, this innovative system combines a sensor network, dedicated signal processing and data analysis software to allow for real-time in-situ monitoring and long term tracking of structural integrity of pressure vessels (such as ducts, manifolds and combustion chambers) in rocket engines. Specifically, the proposed structural health monitoring system will have the following unique features: -Survive harsh environments and missions -Inspect inaccessible areas without disassembly -Ability to detect cracks and monitor crack growth in real-time - Prevent imminent and catastrophic failures in rocket engines The proposed innovation is important as it will address the need for safe as well as reliable advanced space exploration vehicle/propulsion systems. Acellent has been sub-contracted to develop the Structural Health Monitoring system as part of an Integrated System Health Management architecture development for Exploration Systems Research and Technology. The architecture will also support work that is currently on-going to define design solutions for NASA's proposed Crew Exploration Vehicle.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center
(MSFC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center (MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Acellent Technologies, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Sunnyvale, California

Primary U.S. Work Locations

Alabama	California
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.2 Structures
 - └ TX12.2.3 Reliability and Sustainment